

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claim Amendments

Claim 12 has been amended to limit Aⁿ to SiO₄⁴⁻; to replace “a silicon-based compound” with “an organosilicon-based compound” (based on page 6, line 3 of the specification); to incorporate the limitations of claim 20; to specify that the water-soluble calcium salt is calcium chloride or calcium nitrate (based on page 8, line 8 of the specification); and to specify that the alkali metal hydroxide is sodium hydroxide or potassium hydroxide (based on page 8, line 10 of the specification).

Claim 20 has been cancelled, without prejudice or disclaimer.

New claim 33 has been added to the application, specifying that the organosilicon-based compound is at least one compound selected from the group consisting of tetraethoxysilane, tetramethoxysilane, polymethoxysilane and a silane coupling agent, based on page 6, lines 5-7 of the specification.

Rejection Under 35 U.S.C. § 112, First Paragraph

Claim 32 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

The first paragraph of 35 U.S.C. § 112 states that the “specification shall contain a written description of the invention...”. MPEP 2163.02 clarifies that “the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed.”

Claim 32 recites that the X-ray diffraction pattern of calcium hydroxide shows only the pattern of calcium hydroxide. The Examiner’s position, as set forth in item 2 of the Office Action, is that the Example (on page 19, lines 2-4 of the specification) is not consistent with the current claim language.

Initially, Applicants kindly note that the previous response referred to page 18, lines 2-4 of the specification. Additionally, this support was not intended to be exclusive, but rather,

exemplary, as the subject matter of claim 32 is supported throughout the specification, including Examples 1-11. Specifically, the calcium hydroxide of claim 32 is not limited to the one disclosed in a single Example of the specification, but rather, covers other calcium hydroxides disclosed in the specification, so long as the claim limitation is met.

Page 5, lines 26-31 of the specification discloses that the present invention includes calcium hydroxide formed of a solid solution with at least one compound selected from the group consisting of a silicon-based compound, a phosphorus-based compound, an aluminum-based compound, an inorganic acid and an organic acid. Additionally, the specification teaches “The X-ray diffraction pattern of the obtained powder showed only calcium hydroxide. Therefore, it was found that calcium hydroxide obtained from a solid solution of [...] was produced.” Accordingly, based on the teachings of the specification as a whole, Applicants respectfully assert that sufficient written description is provided to demonstrate that Applicants had possession of the claimed invention at the time the application was filed.

Additionally, Applicants note that claim 12 has been amended (as discussed above) to further define its raw materials, i.e., a water-soluble calcium salt, an alkali metal hydroxide and a silicon-based compound.

Furthermore, Applicants note that claim 12 has not been included in the written description rejection. Since claim 32 depends upon claim 12, and thus, includes all the limitations of claim 12, it is respectfully asserted that claim 32 satisfies the written description requirement for the same reasons claim 12 satisfies the requirement. Claim 32 is merely a dependent claim, which further defines the calcium hydroxides of claim 12.

For each of the reasons provided above, it is respectfully requested that the above rejection is not sustainable, and should be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 12, 18, 21, 24, and 31-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Enoki et al. (WO 03/010091) with evidence from “Silicone (Si) and Water” (Lenntech, 1989).

Claims 20 and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Enoki et al. in view of Katsuki et al. (U.S. 6,291,570) with evidence from “Silicone (Si) and Water”.

Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Enoki et al. in view of Katsuki et al., Miyata et al. (U.S. 3,879,525) and Kooli et al. (J. Mat. Sci, 1993) with evidence from "Silicone (Si) and Water".

Claims 12, 18, 21, 24 and 31-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Enoki et al. in view of Katsuki et al. and Miyata et al. with evidence from "Silicone (Si) and Water".

Each of these rejections is respectfully traversed.

Discussion regarding hydrotalcite

Initially, the Enoki reference is silent regarding the hydrotalcite having specific formula (2) as described in amended claim 12. Thus, rejection set forth in item 3 of the Office Action is rendered moot by the incorporation of non-rejected claim 20 into independent claim 12, and withdrawal of this rejection is respectfully requested.

Discussion regarding Calcium hydroxide (Solid solution)

Further, as discussed in the previous response (pages 6 and 7), A^{n-} is contained in calcium hydroxide as a **solid solution** in the present invention (page 5, line 27 of the specification). Therefore, the X-ray diffraction pattern of the obtained powder shows only the pattern of calcium hydroxide.

In contrast to this, an alkaline earth metal silicate is formed **on the surface of** the hydroxide particle in Enoki (paragraph 0079). Therefore, the structure of the calcium hydroxide of the present invention is completely different from that of Enoki.

Discussion Regarding $(SiO(OH)_3)^-$ vs SiO_4^{4-}

In amended claim 12, A^{n-} is limited to SiO_4^{4-} . By comparing Examples 40 and 42 of the specification, it is easily understood that an average secondary particle diameter decreases and a BET surface area increases when A^{n-} is SiO_4^{4-} , in comparison with the case when A^{n-} is $SiO(OH)_3^-$. Decreasing diameter and increasing surface area provide an advantage as an additive for resin, i.e., the calcium hydroxide of the present invention has fine crystals due to inhibition of crystal growth during its production process. Accordingly, it has a large specific surface area, is

highly active and has excellent capabilities of acid neutralization and halogen capturing. Hence, it can be suitably used as a stabilizer for synthetic resins. (Please see page 4, lines 9-15 of the specification). The comparison of Examples 40 and 42 are provided below, for the Examiner's convenience.

Amount Added to Ca(OH) ₂		Ex. 40	Ex. 42
SiO ₂ : wt%		1.0	1.0
(Measured value: wt%)		(0.9)	(0.9)
No. of Solid Solution Ca(OH) ₂		CH40	CH42
A ⁿ⁺		SiO(OH) ₃ ⁻	SiO ₄ ⁻
x		0.02	0.02
SiO ₂ Solid-Solubilized Ca(OH) ₂	Average Secondary Particle Diameter (μm)	1.09	0.8
	BET (m ² /g)	15.5	16.1
Synthesis Method		Reaction Method	Reaction Method

Ex.: Example

The Enoki reference is silent regarding these unexpected advantages of using SiO₄⁴⁻, as required by Applicants' amended claims.

Discussion Regarding Thermal Stability

The composition of the present invention shows superior thermal stability, as demonstrated by the color at the first stage of thermal stabilizer measurement, and the time to blacken. Examples 87 and 93 of Applicants' specification are compared in the Table below. As discussed in the prior response, the combination of calcium hydroxide and hydrotalcite (Ex. 93) clearly shows better thermal stability than calcium hydroxide alone (Ex. 87).

Ex. No.	87	93
Solid Solution Calcium Hydroxide (CH42)	100	50
Hydrotalcite (HT1)		50
Color at the first stage of Thermal Stabilizer measurement*	+++	+
Time to Blacken**	100	150

Enoki is silent regarding the advantages of using the calcium hydroxide of formula (1) together with hydrotalcite. The Examiner asserts that Applicants' argument regarding the superiority of the combination of these components is moot, since the reference *allegedly* suggests a combination of stabilizers. However, as discussed above, the Enoki reference does not teach or suggest the particular hydrotalcite required by Applicants' amended claim 12. Accordingly, the Enoki reference certainly fails to teach unexpectedly superior results achieved by the combination of the particularly recite hydrotalcite and calcium hydroxide of formula (1).

For the reasons described in detail above, the subject matter of Applicants' claims is patentable over the teachings of Enoki. The secondary references cited in the Office Action, i.e., Katsuki et al., Miyata et al., and Kooli et al., are relied upon by the Examiner to *allegedly* teach limitations of dependent claims. However, these references do not remedy the above-discussed deficiencies of Enoki.

Accordingly, the subject matter of Applicants' claims is patentable over each of the cited combinations of references for the reasons provided above. Withdrawal of each of the rejections is respectfully requested.

Conclusion

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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